

Art Unit: 2663

CImpto

JJD

10/25/04

--1. (Amended) An image sensor consisting of a semiconductive carrier (substrate) (1), especially in a CMOS design, on which an arrangement of pixels is placed, and each pixel is assigned a photosensitive detector (4), means to photoelectrically convert a detected photosignal into an electrical signal, and electrical storage means (3) to store the electrical signal, whereby a storage control device (2) is provided to store the electrical signals related to each pixel and read them out in a controlled manner, characterized in that for storing of a number of pictures, in the way of an electronic film, a number of storing means ($C_1 \dots, C_N$) is provided in a single pixel, the number of which storing means corresponding to the number pictures to be stored and that the storage for the first picture to be recorded control device (2) is operating so that the image information of the first picture is read into a first one of the storage means and that for each of the subsequent pictures to be recorded the image information allocated to the corresponding pixel is read into one of the other storage means, respectively, until finally all storage means ($C_1 \dots, C_N$) are filled up.

2. An image sensor according to claim 1, characterized in that the image sensor has a linear arrangement of pixels.
3. An image sensor according to claim 1, characterized in that the image sensor has a flat arrangement of pixels.
4. An image sensor according to claim 1, characterized in that the detector (4) is a photodiode, especially made of crystalline or amorphous silicon.

5. An image sensor according to claim 1, characterized in that the detector (4) is a photodetector made of a III-V alloy or a II-IV alloy.
6. An image sensor according to claim 1, characterized in that the detector (4) has a color filter array.
7. An image sensor according to claim 1, characterized in that the detector (4) is a multispectral diode that has the following sequence of layers:
 - (a) A p-type a-Si:H layer,
 - (b) An intrinsic a-Si:H layer consisting of a first partial layer with more μ -tau product, a second partial layer with less μ -tau product than the first partial layer, and a third partial layer with less μ -tau product than the first and second partial layers,
 - (c) An n-type a-Si:H layer.
8. An image sensor according to claim 1, characterized in that the detector (4) is a light-sensitive MOS capacitor, especially a MOS varactor.
9. An image sensor according to claim 1, characterized in that the storage (3) is an analog storage.
10. An image sensor according to claim 9, characterized in that the storage (3) is a capacitor.

11. An image sensor according to claim 10, characterized in that the storage (3) is a MOS capacitor.
12. An image sensor according to claim 11, characterized in that the capacitor is a plate capacitor whose plate consists of polysilicon.
13. An image sensor according to claim 11, characterized in that the capacitor is designed as a DRAM capacitor.
14. An image sensor according to claim 11, characterized in that the storage is a non-volatile storage, especially an EPROM, EEPROM, FRAM, i.e. a ferroelectric RAM, or a flash memory element.
15. An image sensor according to claim 1, characterized in that the storage is a digital store that is assigned an analog-digital converter.
- 16. (Amended) An image sensor according to claim 1, characterized in that the storage (3) is operated using a multilevel digital approach in which numerous digital bits are represented in an amplitude-discretized analog signal.
17. An image sensor according to claim 16, characterized in that the storage (3) is assigned a reciprocal analog-digital converter that measures the time that the illumination-proportional photostream requires to recharge a capacitor a specific voltage difference.

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18. An image sensor according to claim 1, characterized in that at least two storages (3) are laterally adjacent.
19. An image sensor according to claim 1, characterized in that at least two storages (3) are vertically integrated.
20. An image sensor according to claim 16, characterized in that the storage (3) is designed as an SRAM cell.
21. An image sensor according to claim 1, characterized in that the storage (3) is designed as a magnetic, optical, organic or biological storage cell.
- 22. (Amended) An image sensor according to [one of the prior claims] claim 1, characterized in that the storage control (2) is on the surface of the carrier (1) designed as CMOS substrate.
- 23. (Amended) An image sensor according to claim [23] 1, characterized in that the electrical storage (3) is in a layer between the carrier (1) and the detector (4), and the connection between the storage (3) and storage control (2) is provided by via holes (6).